The Charge for Distributed Generation

By Eileen Westervelt and Steve Siegel

Rolling blackouts in California, the 9/11 terrorist attacks, wars in the Middle East, and the northeast U.S. electrical blackout all point to distributed electrical generation as an idea whose time has come, and the U.S Army is taking notice. The charge is on for distributed generation (DG) electricity, independent of transmission systems backlogged with maintenance, and more resilient to ill intentioned outages.

The Energy and Security Group (ESG) of Reston, VA, is leading the Army Installation Energy Security Plans (AIESP) project sponsored by the Assistant Chief of Staff for Installation Management (ACSIM). The objective is to provide plans to employ DG technologies to produce clean and secure electrical generation for key installation loads. Special features include going beyond a technical prescription to the identification of financing options that can make the technical potential possible. Further, an optimization routine allows for customizing recommendations based on site-specific priorities and laying out tradeoffs for project implementers. Three case studies are being conducted -- at Forts Lewis,WA, Carson, CO, and Riley, KS.

A cross-functional team composed of ESG, the Engineer Research Development Center's Construction Engineering Research Laboratory (ERDC-CERL), the University of Illinois at Urbana Champaign (UIUC), the Center for Army Analysis (CAA), CALIBRE , and Sandia National Laboratories (SNL) identified key electrical loads on Army installations, the technologies to address those loads, and the financing mechanisms to implement the appropriate alternatives. DG options considered were reciprocating engines, fuel cells, microturbines, wind, solar and biomass technologies.

Energy needs were identified that support the installations' mission to deploy combat-ready troops. Key mission requirements included the areas of deployment (supported by mobilization and training) and combat readiness (undergirded by health, safety and installation/community support). Grouping of loads by function enabled time-sequenced consideration as well as identification of appropriate technological response. The technology choices also consider the economic life of the technology and how it fits into the final end-state plan for distributed generation at the facility. Energy storage, plus fuel flexibility and source also figure into the decision matrix. A simplified model for quantifying the electrical loads was developed which accounted for building function, area, and the presence of air-conditioning.

The team identified technically feasible DG options to meet key loads and assessed the energy, financial and environmental impact of potential technologies using a software application named DiGIT, for Distributed Generation Integration Tool. Financing options and eligible federal, state and utility incentives were identified.

Implementation plan options that highlight an overall approach, the key technical opportunities, associated tradeoffs, and financing alternatives were prepared for the three FORSCOM installations. The time is ripe, and the method has been provided for taking proactive measures to ensure available power for key Army missions when and where needed.

The project team is available to explore DG options for additional installations or Installation Management Agency Regional Centers. POC is Steve Siegel, 703-715-3014, SBSIEGEL@aol.com

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